

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau(43) International Publication Date
24 December 2003 (24.12.2003)

PCT

(10) International Publication Number
WO 03/107595 A1(51) International Patent Classification⁷: H04L 12/28,
G01S 5/02

(21) International Application Number: PCT/GB03/02608

(22) International Filing Date: 18 June 2003 (18.06.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
02254243.5 18 June 2002 (18.06.2002) EP
02255255.8 26 July 2002 (26.07.2002) EP(71) Applicant (for all designated States except US): **BRITISH
TELECOMMUNICATIONS PUBLIC LIMITED
COMPANY** [GB/GB]; 81 NEWGATE STREET, LON-
DON EC1A 7AJ (GB).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **ROBINSON,**David, Peter [GB/GB]; 16 CHRISTCHURCH STREET,
IPSWICH, Suffolk IP4 2DJ (GB). **MARSHALL, Ian,**
William [GB/GB]; 6 PUMP CLOSE, BREDFIELD,
WOODBRIDGE, Suffolk IP13 6DD (GB).(74) Agent: **WILLIAMSON, Simeon, Paul**; BT GROUP
LEGAL, INTELLECTUAL PROPERTY DEPARTMENT,
8TH FLOOR, HOLBORN CENTRE, 120 HOLBORN,
LONDON, EC1N 2TE (GB).

(81) Designated States (national): CA, US.

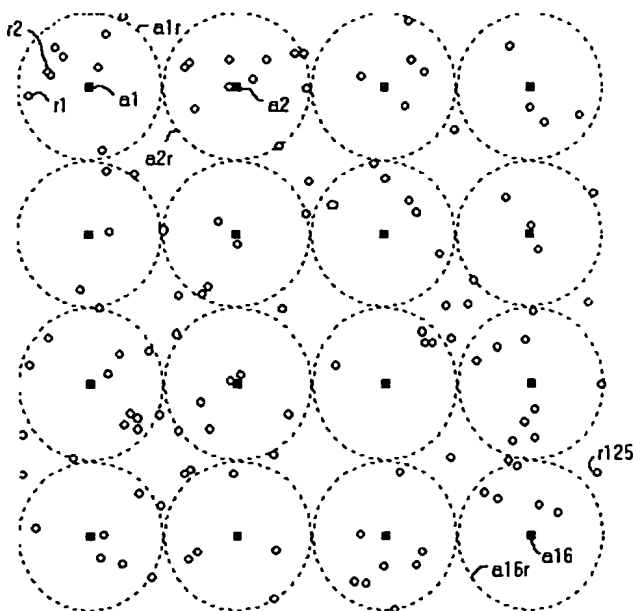
(84) Designated States (regional): European patent (AT, BE,
BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU,
IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR).

Published:

— with international search report

*For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.*

(54) Title: METHOD AND APPARATUS FOR LOCATING DEVICES



(57) **Abstract:** A method of obtaining positional information about individual wireless devices a1-a16, r1-r125 within a wireless ad-hoc network including a plurality of position determining devices r1-r125 which include means for estimating the distance between themselves and other similar devices which are within range. The method includes the steps of: calculating the hypothetical distance between a respective node's estimated position and the estimated position of each of its neighbouring devices whose broadcast estimated position has been received and whose distance from the respective node has been measured comparing the calculated hypothetical distance with the measured distance; modifying the respective node's estimated position so as to reduce an error function dependent upon the difference between the hypothetical and measured distances and periodically resetting the respective node's estimated location to a new position in a manner which does not seek to reduce the error function within a single iteration so as to avoid the location from getting stuck in a local minimum value of the error function.